

WHAT IS CLAIMED IS:

1 1. A sensor package comprising:  
2 a force sensing element having an element surface; and,  
3 a housing having a housing surface, wherein the housing is arranged to  
4 support the force sensing element so that the element surface and the housing surface  
5 are substantially coplanar and so that the element surface of the force sensing element  
6 directly senses a force without need of an actuator.

1 2. The sensor package of claim 1 wherein the sensing element has a  
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports  
3 the sensing element within the well, and wherein the shelf has a depth with respect to  
4 the thickness of the sensing element such that element surface protrudes above the  
5 housing surface.

1 3. The sensor package of claim 1 wherein the sensing element has a  
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports  
3 the sensing element within the well, and wherein the shelf has a depth with respect to  
4 the thickness of the sensing element such that element surface is depressed with respect  
5 to the housing surface.

1 4. The sensor package of claim 1 wherein the sensing element has a  
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports  
3 the sensing element within the well, and wherein the shelf has a depth substantially  
4 matching the thickness of the sensing element.

1 5. The sensor package of claim 4 wherein the housing has a connection  
2 pad within the well, wherein the sensing element has a connection pad, and wherein  
3 the connection pads of the housing and the sensing element are electrically coupled  
4 together when the sensing element is supported by the shelf of the housing.

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1                   6. The sensor package of claim 5 wherein a conductive adhesive  
2 electrically couples the connection pads of the housing and the sensing element.

1                   7. The sensor package of claim 6 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 electrical isolation of the sensor package.

1                   8. The sensor package of claim 6 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 environmental protection for the sensor package.

1                   9. The sensor package of claim 6 wherein the shelf has an adhesive  
2 reservoir to hold the conductive adhesive.

1                   10. The sensor package of claim 5 wherein the shelf is arranged to  
2 prevent the conductive adhesive from migrating around an edge of the sensing element  
3 and causing sensing element edge electrical shorting.

1                   11. The sensor package of claim 1 wherein the housing has a  
2 connection pad, wherein the sensing element has a connection pad, and wherein the  
3 connection pads of the housing and the sensing element are electrically coupled together  
4 when the sensing element is supported by the housing.

1                   12. The sensor package of claim 11 wherein a conductive adhesive  
2 electrically couples the connection pads of the housing and the sensing element.

1                   13. The sensor package of claim 12 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 electrical isolation of the sensor package.

1 14. The sensor package of claim 12 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 environmental protection for the sensor package.

1 15. The sensor package of claim 12 wherein the conductive adhesive  
2 is held in an adhesive reservoir of the housing.

1 16. The sensor package of claim 1 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 electrical isolation of the sensor package.

1 17. The sensor package of claim 1 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 environmental protection for the sensor package.

1 18. A sensor package comprising:  
2 a force sensing element having an element surface; and,  
3 a housing having a housing surface, a well, and first and second shelves  
4 within the well, wherein the first and second shelves of the housing are arranged to  
5 support the force sensing element so that the element surface and the housing surface  
6 are substantially coplanar and so that the element surface of the force sensing element  
7 directly senses a force without need of an actuator.

1 19. The sensor package of claim 18 wherein the housing has a  
2 connection pad within the well, wherein the sensing element has a connection pad, and  
3 wherein the connection pads of the housing and the sensing element are electrically  
4 coupled together when the sensing element is supported by the first and second shelves  
5 of the housing.

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1 20. The sensor package of claim 19 wherein a conductive adhesive  
2 electrically couples the connection pads of the housing and the sensing element.

1 21. The sensor package of claim 20 wherein the first and second shelves  
2 are arranged to prevent the conductive adhesive from migrating around an edge of the  
3 sensing element and causing sensing element edge electrical shorting.

1 22. The sensor package of claim 20 wherein the first and second  
2 shelves each has an adhesive reservoir to hold the conductive adhesive.

1 23. The sensor package of claim 16 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 electrical isolation of the sensor package.

1 24. The sensor package of claim 16 further comprising a membrane  
2 covering the surfaces of the housing and the sensing element in order to provide  
3 environmental protection for the sensor package.

1 25. A method of packaging a force sensing element having an element  
2 surface comprising the following steps:

3 a) applying the force sensing element to a housing having a housing  
4 surface so that the element surface and the housing surface are substantially coplanar;  
5 and,

6 b) attaching the force sensing element to the housing.

1 26. The method of claim 25 wherein the force sensing element has a  
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf has a  
3 depth substantially matching the thickness of the force sensing element, and wherein  
4 step a) comprises the step of applying the force sensing element to the housing so that  
5 the shelf supports the force sensing element within the well.

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1 27. The method of claim 25 wherein the housing has a connection pad,  
2 wherein the force sensing element has a connection pad, and wherein step b) comprises  
3 the step of adhesively binding the connection pads of the housing and the force sensing  
4 element together so that the force sensing element is attached to the housing and so that  
5 the connection pads of the housing and the force sensing element are electrically  
6 coupled together.

1 28. The method of claim 25 further comprising the step of covering  
2 the surfaces of the housing and the force sensing element with a membrane in order to  
3 provide electrical isolation of the force sensing element.

1 29. The method of claim 25 further comprising the step of covering  
2 the surfaces of the housing and the sensing element with a membrane in order to  
3 provide environmental protection for the force sensing element.

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